Intellectual Property Office of New Zealand
Te Pou Rāhui Hanga Hou

CERTIFICATE

This certificate is issued in support of an application for Patent registration in a country outside New Zealand pursuant to the Patents Act 1953 and the Regulations thereunder.

I hereby certify that annexed is a true copy of the Provisional Specification as filed on 31 March 2002 with an application for Letters Patent number 515579 made by THE CHRISTIAN CHURCH COMMUNITY TRUST.

I further certify that the Provisional Specification has since been postdated to 31 March 2003 under Section 12(3) of the Patents Act 1953.

Dated 1 April 2003.

Neville Harris
Commissioner of Patents

515579

POST-DATED UNDER SECT 12(4)
to 20/3/2002

POST-DATED UNDER SECT 12(4)
to 31/3/2002

NEW ZEALAND

PATENTS ACT, 1953

No:

Date:

PROVISIONAL w.e.f. 1/4

~~COMPLETE~~ SPECIFICATION

PLANT CONTAINER LINERS

We, THE CHRISTIAN CHURCH COMMUNITY TRUST, a charitable trust incorporated under the Charitable Trusts Act 1957 of Heaphy Road, Lake Haupiri, Westland, New Zealand, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:

PLANT CONTAINER LINERS

Field of the Invention

This invention relates to an apparatus and method for forming three-dimensional shaped items, particularly from particulate material. In particular, although not exclusively, the invention relates to methods of forming liners for plant containers, the liners made from particulate materials, and in particular sphagnum moss. Such liners are useful in lining hanging baskets, especially those baskets in the form of skeletal containers. While the specification refers primarily to the use of sphagnum moss, the principles of the invention may be extended to other similar vegetative fibre materials such as coconut fibre.

Background to the Invention

Because of its unique water retaining properties, and pleasant appearance as a natural plant substance, sphagnum moss has traditionally been a favoured material for use in conjunction with floral arrangements and related horticultural activities.

Traditionally, sphagnum moss has been sold mostly in a dried state but sometimes in a wet state, but generally in a natural loose form in which each filament of the moss plant is separate and distinguishable.

In recent decades, a new technology has developed in the sphagnum moss industry. This is the use of pressure to compress the loose moss in a press into compact flat forms. In particular, the long filaments of New Zealand, Chilean and Tasmanian sphagnum moss are idea for the pressing of sphagnum moss. The sheet of compressed sphagnum moss are of various thickness, usually from 2 or 3 mm to about 7 mm. They are somewhat like balsa wood in terms of flexibility and they look somewhat like particle board in texture. The moss is so compressed that the sheets of moss are not easily identifiable as being moss.

In its traditional loose form, sphagnum moss has always been associated with hanging baskets. One reason for this is its particular ability to absorb and retain water up to and exceeding 20 times its own weight. Another is its natural and aesthetically pleasing appearance.

The most common traditional method of using sphagnum moss to line hanging baskets is to place some loose moss in the bottom of a wire hanging basket, then cover the moss with a little potting mix. The basket is gradually filled, firstly by building up the outer layer of sphagnum moss around the outside of the basket and secondly by holding it in place with a little more soil and potting mix. This process is repeated several times until the lining of sphagnum moss reaches right to the upper rim of the hanging basket.

This is obviously a very labour intensive task. For this reason it has mostly been performed at home by the enthusiastic gardener, and by staff in some garden centres. In this form, hanging baskets with a layer of sphagnum moss directly inside the wire basket can be made available only when they are filled with soil and potting mix, because it is the soil and potting mix which holds the outer lining of loose filaments of moss in place.

It is evident that there is an extremely limited scope for selling sphagnum moss lined hanging baskets in this form. The labour content in filling them is very high. In addition, transporting baskets in this form from one location to another can be very difficult and costly.

For these reasons, sphagnum lined hanging baskets filled in this way would normally have to be made and sold in the same garden centre. Such articles could not be manufactured on a large scale using technology and production machinery and then transported in bulk nationally and internationally to many retail outlets. Consequently only very small numbers of such sphagnum lined baskets are made up in this way.

One company in USA has taken a step forward in this regard and created a moss lined hanging basket which can much more readily be transported in cartons as freight, or even posted in the mail, which makes them much more marketable than the previously mentioned type. In these, the short filaments of loose moss are fixed onto the outside of the basket with very fine filament or wire - much like fishing net. This means that no soil or potting mix is needed to hold the moss in place.

However, the process of sewing the filaments or moss onto the outside of the basket is very time consuming and keeps this type of moss lining within the category of a hand crafted item. As such, this type of liner will always be relatively expensive, limited in numbers, and therefore a

specialty item.

Through the use of heavy pressure dry particulate sphagnum moss can be compressed into flat sheets that bind together due to the fiberous nature of this species of moss. Using this method of processing, the compressed dry, flat sheets are very brittle and crack easily. In New Zealand, one company markets a compressed sphagnum moss product which when unfolded is shaped like a Maltese cross. This item is sold in flat configuration. The moss is so brittle in its compressed state that to protect it from damage when offered for sale, each liner must be protected by either:

a) first wrapping the liner in plastic then placing each liner inside a strong cardboard package or outer to protect the liner; or

b) placing and packaging the liner inside a wire basket and then wrapping/sealing both the basket and the liner in plastic.

The flat liner to be placed inside a hanging basket must first be wetted so that it partially reconstitutes, thus allowing it to be unfolded and moulded to fit in and contour to the shape of the basket.

Disadvantages of a liner in this form include the following points:

1) the compressed sheet of moss must often be redampened to enable it to be folded before being inserted and sealed in a plastic bag.
2) such a folded liner is very brittle must be protected by heavy packaging so as to withstand travel and handling in a retail setting;
3) initially at least, when being used the liner does not readily conform satisfactorily to the shape of the curved handing basket.
4) where the sections of the Maltese cross shaped liner meet, the edges do not overlap nor are they fixed together, and therefore, during the initial period in particular, the soil will often fall through the spaces between the sections in a manner unacceptable for the end user.

Accordingly, the liners must first have the protective cardboard packaging removed, then they must be wetted to obtain flexibility.

Market research shows that purchasing public has difficulty in:

a) comprehending that the flat dry particle board like liner is actually moss;

b) in determining how much water should be applied so that the liner can be made flexible:- too much water and the liner will fall apart, too little water and the brittle liner will crack allowing soil to fall through the liner

3) Once placed inside the wire basket the liner must be further wetted so that it can be moulded to attain the three-dimensional shape of the basket.

4) Further, in order to side plant the liner once it has been moulded and placed inside the receptacle (usually a wire basket), the liner must often be further wetted to allow holes to be made for plants to be inserted.

It is an object of the present invention to provide an apparatus/method for forming three-dimensional shaped items from particulate material, which will address at least some of the foregoing problems or at least provide the public with a useful choice.

Summary of Invention

In accordance with a first aspect of the present invention there is provided an apparatus for forming a three dimensional shaped item from particulate material, the apparatus comprising: cooperating first and second die members which are relatively movable between an open configuration and a closed configuration to form the three dimensional shaped item; and a support panel to support the particulate material, the support panel adapted to extend between the two die members, the support panel having a flexible web and being adapted to adopt an operational position between the two die members such that on closing the die members to the closed configuration, the web is conformable to the shape of the cooperable die members when in the closed configuration.

Preferably, the die members include a female die member having a die cavity and a die opening and a male die member insertable into the die cavity to co-operate with the female die member to form the three dimensional shaped item. In this preferred embodiment, the support panel is adapted to extend across the die opening.

Preferably, the flexible web includes a stretchable portion. Furthermore, the flexible web might include a non-stretchable portion. In a most preferred form of the invention, the flexible web includes a specific combination of stretchable and non stretchable portions. The stretchable portions enable the web to conform to the shape of the cooperating dies while the non stretchable portions allow the particulate material to be formed evenly into the desired shape.

Preferably the non-stretchable portion of the support panel is centrally disposed in the web. The non-stretchable portion is shaped such that when the web is conformed to the shape of the cooperable die members, the non-stretchable portion forms a continuous three dimensional shape in the die cavity. An appropriate shape to achieve this could be the shape of a Maltese cross which is a cruciform shape with each of the four legs increasing in width radially. However, the shape is not limited to having four legs and any number between three and ten might be implemented in the substantially non-stretchable portion.

The stretchable portion preferably extends beyond the non-stretch portion, at least to the edges of the die cavity. Where the die members comprise upper and lower die members, the web may be supported directly by the top of the lower die member. Alternatively, the support panel may incorporate a frame to which the outer periphery of the stretchable portion is attached. The frame may be rectangular or square. Additionally, the frame may be removably attachable to the lower die member.

Suitably, the stretchable portion may comprise a stretchable sheet material such as a knitted or woven stretch fabric (eg containing LYCRA™). The substantially non-stretchable portion may also comprise a relatively inextensible sheet material. A suitable material might be a woven fabric such as cotton drill.

The substantially non-stretchable portion may be inserted into a complimentarily shaped void within the stretchable portion and joined along the edges. For example, the substantially non-stretchable portion could be sewn to the stretchable portion along overlapping edges. In an alternative arrangement, the substantially non-stretchable portion could be overlaid on a layer of stretch material and joined thereto. The substantially non-stretchable portion would thereby restrain the stretch material underneath and the stretchable portion would be defined beyond the boundaries of the substantially non-stretchable portion. The substantially non-stretchable portion

could be bonded to the stretchable portion by adhesive or the like and/or sewn to provide additional reinforcement.

The support panel may be arranged in a substantially level configuration in an operational position between the two die members to allow the particulate material to be placed thereon. For this purpose the support panel suitably presents a level, substantially planar surface. In this configuration, the stretchable portion may extend in a taut manner or even be slightly pre-stretched. The support panel may be removable from the operational position to allow loading of the support panel at an alternative location. The support panel could also comprise two webs as defined above to clasp the sphagnum moss therebetween. In such an embodiment, the die arrangement is not limited to a vertically closing arrangement.

In accordance with a second aspect of the present invention, there is provided a method of producing a three dimensional shaped item from particulate material using a support panel comprising a flexible web, the method comprising: spreading a layer of the particulate material over the support panel; and compressing the particulate material on the support panel into a three dimensional shape wherein the flexible web is conformable to the three dimensional shape.

Preferably the particulate material is a vegetative material, most preferably sphagnum moss. An adhesive may be employed to bind the particles of particulate material together. The sphagnum moss is substantially dry, yet slightly moist in a layer which is suitably thick. The preferred moisture level is 18-22% by weight and the preferred thickness is 50 mm. By precisely controlling the thickness and moisture levels of the moss used in the process, the resulting three dimensional liner is made flexible and is not a brittle sheet.

In a preferred form of the invention, the flexible web, to achieve this, includes a stretchable portion. Moreover, the flexible web may further comprise a substantially non-stretchable portion.

Preferably the support panel is held within a frame. Preferably the pressing of the particulate material takes place within a die comprising two parts, a male die member and a female die member having a die cavity. The support panel is preferably disposed between the male die member and the die cavity. Preferably the particulate matter is moulded at a pressure of at least about 3000 psi.

Preferably the three dimensional item is basket or pot shaped.

Preferably the non-stretch material is in a cross shape, such as a Maltese cross.

Desirably, the non-stretchable portion material is joined to the edge of the stretchable portion.

Alternatively, the non-stretchable portion may be overlaid and attached to a sheet of stretchable material as explained in connection with the first aspect of the invention.

The non-stretchable portion may comprise a woven fabric like a durable cotton fabric such as drill. Preferably the stretchable material is knitted cotton, polyester, or nylon and further comprises an amount of LYCRA™.

In accordance with a third aspect of the invention, there is provided a three dimensional shaped item formed according to the method set out above.

In accordance with a fourth aspect of the invention, there is provided a moulding support panel for supporting and moulding particulate material, the panel having a frame and a flexible web held within the frame, the flexible web comprising a stretchable portion and a substantially non-stretchable portion.

This invention may also be said broadly to consist in the parts, elements and features referred to or indicated in the specification of the application, individually or collectively, and any or all combinations of any two or more said parts, elements or features, and where specific integers are mentioned herein which have known equivalents in the art to which this invention relates, such known equivalents are deemed to be incorporated herein as if individually set forth.

The invention consists in the foregoing and also envisages constructions of which the following gives examples only.

Brief Description of the Drawings

One preferred form of the invention and modifications thereof will now be described with reference to the accompanying drawings in which:

Figure 1 shows filaments of harvested sphagnum moss;

Figure 2 shows sphagnum moss compressed into sheets;

Figure 3 illustrates a completed plant container liner made of sphagnum moss;

Figure 4 illustrates the liner of Figure 3 with shrink wrapping;

Figure 5 illustrates a number of liners stacked in nested configuration and wrapped;

Figure 6 shows the completed plant container liner in use;

Figure 7 shows a plan view of a frame and material setup used in the forming process according to a preferred embodiment of the present invention;

Figure 8 shows a cross sectional view of the frame of Figure 7;

Figure 9 shows a plan view of the frame of Figure 7 together with a male die member as positioned during the moulding process; and

Figure 10 shows a cross-sectional view of the frame, mould and male die member during the moulding process.

Preferred Embodiments of the Invention

Figure 1 shows filaments of harvested sphagnum moss 100. According to the Encyclopaedia Britannica, mosses are usually classified into three orders: Sphagnales, Andreaeales and Bryales. The order Sphagnales has a single genus sphagnum, and is often the chief component of peat bogs and is usually known as bog or peat mosses. We use sphagnum moss in our basket liners which

is the preferred type of moss. However, the invention is not limited to sphagnum moss and suitable moss from anywhere in the world may be utilised in the invention. There are approximately 14 000 species of all types of moss throughout the world, whereas there are only approximately 300 species of sphagnum moss (Colliers Encyclopaedia 16 "Moss", 18 "Peat Moss" 1966). It is believed there are 5 species of sphagnum moss found on the West Coast of New Zealand's South island. These are Sphagnum Falcatulum, Sphagnum Subnitens, Sphagnu Christatum, Sphagnum Australe, Sphagnum Subsecundum. Any of these species alone or in combination may be used in our liners. Furthermore, moss from Chile, Sphagnum Magellanicum, is also particularly appropriate for forming our liners.

Sphagnum moss is recognised in the market as greatly superior to other types of moss in its water retention properties, being able to absorb up to twenty times its own mass of water. Largely because of its absorbency, it has been used as packing for nursery stock and cut flowers, for surgical dressing, as an additive to soil and as litter for stables and chicken houses. Because so many of the cells in the leaves and stems are large, empty and have porous walls, sphagnum can absorb tremendous quantities of liquids and odours. In addition, the plant contains a small amount of sphagnol, a phenolic compound with some antiseptic properties. (Encyclopaedia Britannica 15 "Moss" 1963).

The sphagnum moss we use has long scaly strands, with relatively large leaves, which have the property that when dried and compressed using our process, the leaves and stems interlock in a flexible structure that retains its shape and is self-supporting without the use of glues or other supporting materials, and is still easily recognisable as moss. The sphagnum moss 100 is also used for its aesthetic value in hanging basket arrangements. The sphagnum moss is harvested

from a natural and renewable source. The moss selected to manufacture the liners is almost entirely, if not 100% sphagnum moss with no less than 40 percent having strands exceeding 75mm in length.

Initially, some of the excess water may be removed from the freshly harvested sphagnum moss 100 through the use of a centrifuge or calendar rolls. The sphagnum moss 100 is then dried either in a kiln or with natural sunlight. Preferably, the sphagnum moss 100 is dried in a kiln with a continuous conveyor (not shown), the speed of which is controllable. Suitably, an automatic feeding system (not shown) that deposits the moss onto the kiln's continuous conveyor is also provided. The kiln is in the form of a tunnel and operates to circulate heated air which is generated from hot water heat exchangers operating at a temperature as high as 140 C. The moss is gradually dried as it travels through the kiln.

After drying, the moss may be left in piles to cool and reabsorb some moisture from the atmosphere. If necessary, additional moisture is then added to the moss through the use of pressurised water misting nozzles. The desired amount of water added is between 0.014gm of water per cm^2 of moss liner sheet and 0.070gm of water per cm^2 of moss liner sheet. This is carried out over a 24 hour period and enables the moss to become supple and flexible. The optimum moisture content of the moss prior to pressing is 18 to 20 percent by weight although a range of 3 to 17 percent by weight is commonly used. It is considered that anything in the range of 2 to 20 percent by weight will work.

When an appropriate moisture content has been reached, the sphagnum moss is able to be compressed into sheets 102 as illustrated in figure 2. The sphagnum moss sheet 102 has the ability to absorb a significant quantity of water 104 and reconstitute into its substantially original

state. The sheet 102 illustrated in figure 2 is included to provide the reader with an appreciation of the ability of sphagnum moss to reconstitute from a compressed, substantially dried state to its substantially original state. In the present invention however, the sphagnum moss is shaped into a three dimensional product and thus figure 2 is provided only to aid understanding of the properties of sphagnum moss.

Figure 10 illustrates the apparatus used to form the liners 11 in accordance with the present invention. The apparatus comprises a female die member 27 defining a die cavity 27a having a die opening 27b. The shape of the die cavity 27a corresponds substantially to the three dimensional shape of the liner 11. Furthermore, the apparatus includes a male die member 26 receivable within the die cavity 27a to form the liners 11. A support panel 13 is disposed between the male die member 26 and the female die member 27 as will be explained further in connection with Figures 7 and 8.

Referring to Figures 7 and 8, the support panel 13 comprises a flexible web having a central portion 23 comprised of substantially non-stretchable material surrounded by an outer portion of stretchable material. Both the central portion of non-stretchable material and the outer portion of stretchable material are of flexible fabric with the non-stretchable material comprising cotton drill and the stretchable material comprising a knitted fabric incorporating lycra. The central portion 23 and the outer portion 21 are held in flat configuration by a square frame 20 as can be seen from Figure 8.

It can be seen that the non-stretchable central portion 23 is formed in the shape of a Maltese cross. The outer portion 21 is formed with a cut out corresponding to the shape of the central portion 23 but with overlapping edges between the central portion 23 and the outer portion 21 so that the

two portions can be stitched together. The support panel 30 is arranged over the female die member 27. Figure 10 illustrates the position of the male die member 26 during its downward stroke. However, the male die member is also moveable to a position (not shown) where it is above the support panel 13. In this configuration, the flexible web of the support panel 13 presents a substantially level substrate onto which the particulate material in the form of sphagnum moss can be deposited. Alternatively, the sphagnum moss may be deposited onto the support panel 13 at a remote location from the die members 26, 27 and moved into position subsequently. Sphagnum moss is deposited onto the support panel 13 within the confines of the dotted line 24. For a liner having a diameter of 35 cm and a depth of 16 cm, 135 gms of sphagnum moss is used.

During operation of the die 26, 27, the base of the male die member 26 initially makes contact with the sphagnum moss within the centre of the flexible web. As the male die member is moved further downwardly, the sphagnum moss material underneath the base of the male die member 26 is trapped between the male die member and the flexible web. As the male die member 26 continues in its downward stroke, the sphagnum moss disposed progressively outwardly comes into contact with the underside of the male die member 26 and is accordingly held between the male die member 26 and the flexible web. In this fashion, the invention minimises the likelihood of the moss accumulating at the base of the mould with a more even distribution of sphagnum moss material resulting throughout the finished liner. The sphagnum moss is moulded at pressures ranging from 3000-4000 psi to bind the strands of sphagnum moss together without adhesives.

The Maltese cross formation illustrated in Figure 7 is designed such that as the support panel is pushed into the die cavity 27a, the side edges of each leg of the Maltese cross formation will

meet the adjacent side edge on the adjacent leg. In this manner, the central portion 23 of non-stretch material will extend substantially continuously about the internal periphery of the die cavity 27a.

The die operates at a pressure of at least 3000 psi. After moulding, the annular lip of the liner 11 may be trimmed as necessary. Additionally, the top surface of the female die number 27 surrounding the die opening 27b may incorporate an annular recess (not shown) so as to reduce the degree of compression to this lip portion of the liner. This enables the lip portion of the liner to retain some of the characteristics of unpressed moss making the composition of the product more easily recognisable by potential customers. The depth of the annular recess ought to be designed bearing in mind the need for some compression to retain strength in the lip portion 2.5-3.5 cm is the preferred depth.

Furthermore, the exterior of the compressed sphagnum moss liner 11 initially has the appearance of cardboard and consequently is not easily recognisable to the purchasing public as a sphagnum moss liner. To bring the surface of the sphagnum moss liner to more closely resemble the original natural state of sphagnum moss, a fine mist of water is sprayed onto the exterior side only of the liner using an atomised fluid spray. The amount of water is about 113-173 g/m^2, preferably 143 g/m^2. The temperature of the water is also controlled within a range of 15-25°C. The liner 11 will resemble that illustrated in Figure 3 with the surface layer 11a of the exterior of the blank 11 reconstituted as illustrated. The degree of reconstitution (143 g/m^2) enables the liner to be pliable to the extent that it is able to be folded and unfolded with minimal or no degradation of the fibre integrity and yet enables the walls of the liners to be sufficiently rigid as to be self-supporting. To prevent drying out, the liners are enclosed in a sealed package as shown in Figures 4 and 5.

Following moulding and partial reconstitution, the liners 11 may have appropriate product information and advertising sheets placed in or over the liners 11 in such a manner that they contour to the curved surfaces of the liners 11.

Figure 4 illustrates the liner 11 enclosed within a bag 11b of shrink wrap plastic. The bag is sealed in a circular shape around the top of the liner 11, 10 to 100 mm from the top edge with a purpose built circular sealing machine. This provides a surplus of plastic which fits down inside the liner 11 against the sides and the bottom. The plastic is held in position against the sides and bottom of the liner 11 with a wire frame weighted with 1.5 kg of weights. The wire frame conforms to the inner contour of the liner 11. As the wire frame (not shown) is inserted into the liner 11, the plastic is held against the sides and bottom of the liner. Holes punched into the plastic prior to sealing enable air trapped inside the bag to escape when the wire frame is inserted into the liner. The liner 11 with the sealed bag and the weighted wire frame is passed through a shrink oven akin to a conveyor bread oven. The liner 11 and accompanying wrap is then allowed to cool, after which the weighted wire frame is removed. The result is that the plastic still lies snug against the interior and the bottom of the liner and not stretched tightly across the top of the liner 11 as would occur in conventional shrink wrapping.

The use of a circular bag with a circular sealer eliminates bunching of the plastic on the outside of the liner that would occur with the use of a square bag. Additionally, with three liners nested together and shrink wrapped as a pack of three, the shrink wrapping process has the additional benefit of compacting the liners more tightly together than prior to wrapping. This enables more three-packs to fit into a cardboard carton than a single shrink wrapped package.

The intended use of the liner is illustrated in Figure 6. As shown, the liner 11 is inserted into a

conventional hanging basket assembly 11d. Once the liner 11 is inserted into the basket, it may be fully reconstituted by having water poured over or by being soaked in water for a matter of minutes, to enable full reconstitution to occur.

Advantages of the preferred form of the invention are as follows:

a) a three dimensional shaped liner made from particulate material such as sphagnum moss which minimises gaps and bunching forming in the sides;

b) the liner, while being made of compressed moss, is still clearly recognisable as being a liner made of sphagnum moss;

c) the liner is strong enough to stand by itself without needing the support of strong supporting packaging or a wire basket/cage;

d) the liner is flexible enough to withstand travelling and handling by interested consumers at the point of retail sale ie not likely to crack as soon as is handled or is partially compressed/squeezed;

e) after the liner is unwrapped, it can, in one simple step, be easily placed inside a wire-basket and is immediately ready to use for both side-planting and top planting. The liner does not need wetting or unfolding, further rewetting and moulding so as to conform to the wire-basket/receptacle;

f) the liner can be easily side-planted without the need for additional wetting of the sides.

WHAT WE CLAIM IS:

1. An apparatus for forming a three dimensional shaped item from particulate material, the apparatus comprising: cooperating first and second die members which are relatively movable between an open configuration and a closed configuration to form the three dimensional shaped item; and a support panel to support the particulate material, the support panel adapted to extend between the two die members, the support panel having a flexible web and being adapted to adopt an operational position between the two die members such that on closing the die members to the closed configuration, the web is conformable to the shape of the cooperable die members.

2. The apparatus as claimed in claim 1 wherein the flexible web includes a stretchable portion.

3. The apparatus as claimed in claim 2 wherein the flexible web further comprises a substantially non-stretchable portion.

4. The apparatus as claimed in claim 3 wherein the die members include a female die member having a die cavity and a die opening and a male die member insertable into the die cavity to co-operate with the female die member to form the three dimensional shaped item.

5. The apparatus as claimed in claim 4 wherein the non-stretchable portion of the support panel is centrally disposed in the web and the non-stretchable portion is shaped such that when the web is conformed to the shape of the cooperable die members, the non-stretchable portion forms a continuous three dimensional shape in the die cavity.

6. The apparatus as claimed in claim 5 wherein the non-stretchable portion is a cruciform shape with each of the four legs increasing in width radially outwards.

7. The apparatus as claimed in any one of claims 2 to 6 wherein the stretchable portion comprises knitted stretch fabric.

8. The apparatus as claimed in claim any one of the preceding claims wherein the support panel incorporates a frame to which the outer periphery of the stretchable portion is attached.

9. A method of producing a three dimensional shaped item from particulate material using a support panel comprising a flexible web, the method comprising: spreading a layer of the particulate material over the support panel; and compressing the particulate material on the support panel into a three dimensional shape wherein the flexible web is conformable to the three dimensional shape.

10. The method as claimed in claim 9 wherein the flexible web includes a stretchable portion.

11. The method as claimed in claim 10 wherein the flexible web further comprises a substantially non-stretchable portion.

12. The method as claimed in claim 11 wherein the substantially non-stretchable portion is centrally disposed in a cross shape and the stretchable portion surrounds the cross shape.

13. The method as claimed in any one of claims 10 to 12 wherein the stretchable portion

comprises a knitted stretch fabric.

14. The method as claimed in any one of claims 9 to 13 wherein the flexible web is held by a frame.

15. The method as claimed in any one of claims 9 to 14 wherein the pressing of the particulate material takes place within a die comprising a male die member and a female die member having a die cavity and the support panel is disposed between the male die member and the die cavity.

16. The method as claimed in any one of claims 9 to 15 wherein the three dimensional item is pot shaped.

17. The method as claimed in any one of claims 9 to 16 wherein the particulate material is a vegetative material.

18. The method as claimed in claim 17 wherein the particulate material is sphagnum moss.

19. The method as claimed in claim 18 wherein the sphagnum moss is any of the following species, alone or in combination:
Sphagnum Falcatulum; Sphagnum Subnitens; Sphagnum Cristatum; Sphagnum Australe; Sphagnum Subsecundum.

20. A three dimensional shaped item formed according to the method as claimed above in any one of claims 9 to 19.

21. An apparatus for forming a shaped three-dimensional item from particulate material substantially as hereinbefore described with reference to figures 3 to 10.

22. A method of producing a three dimensional shaped item from particulate material substantially as hereinbefore described with reference to figures 3 to 10.

23. The three dimensional shaped item substantially as hereinbefore described with reference to figures 3 to 10.

24. The moulding support panel substantially as hereinbefore described with reference to figures 3 to 10.

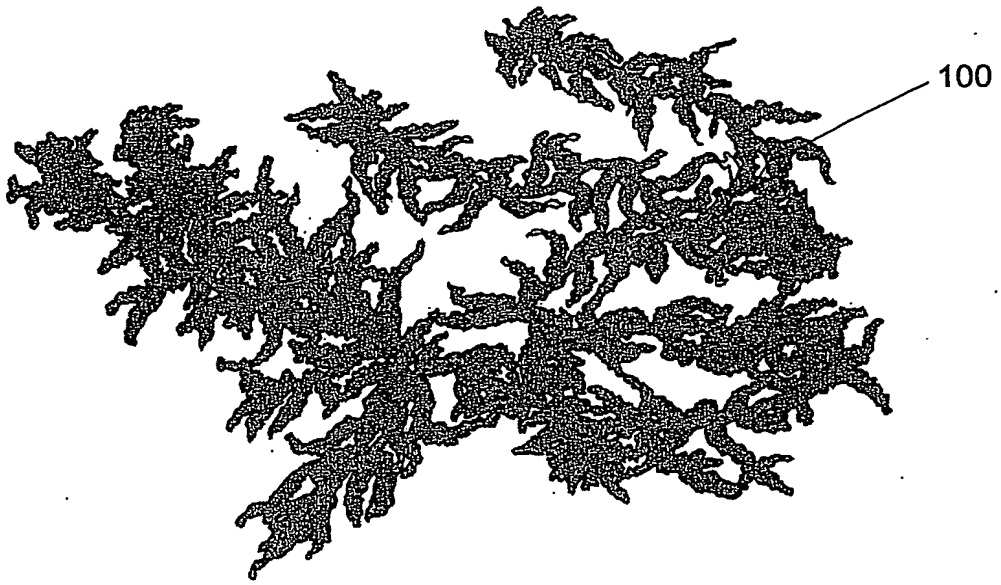

FIGURE 1

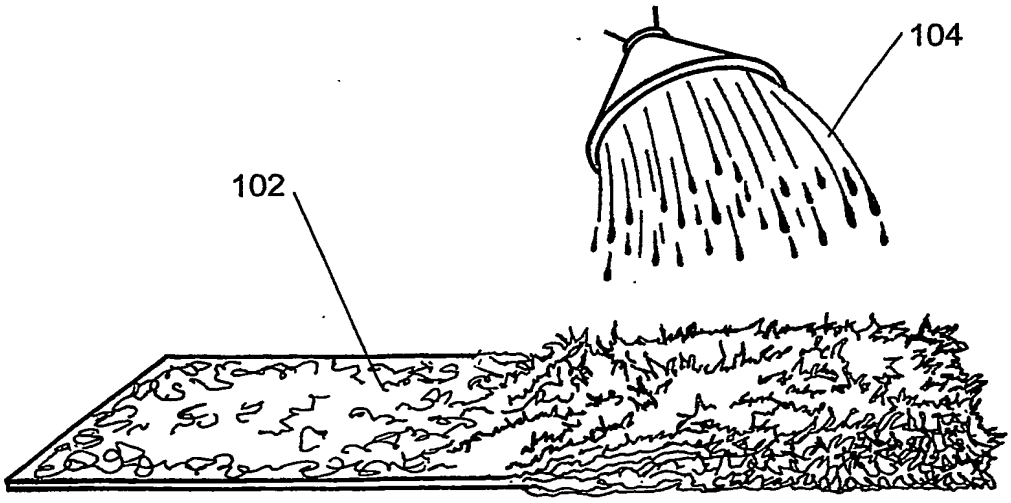

FIGURE 2

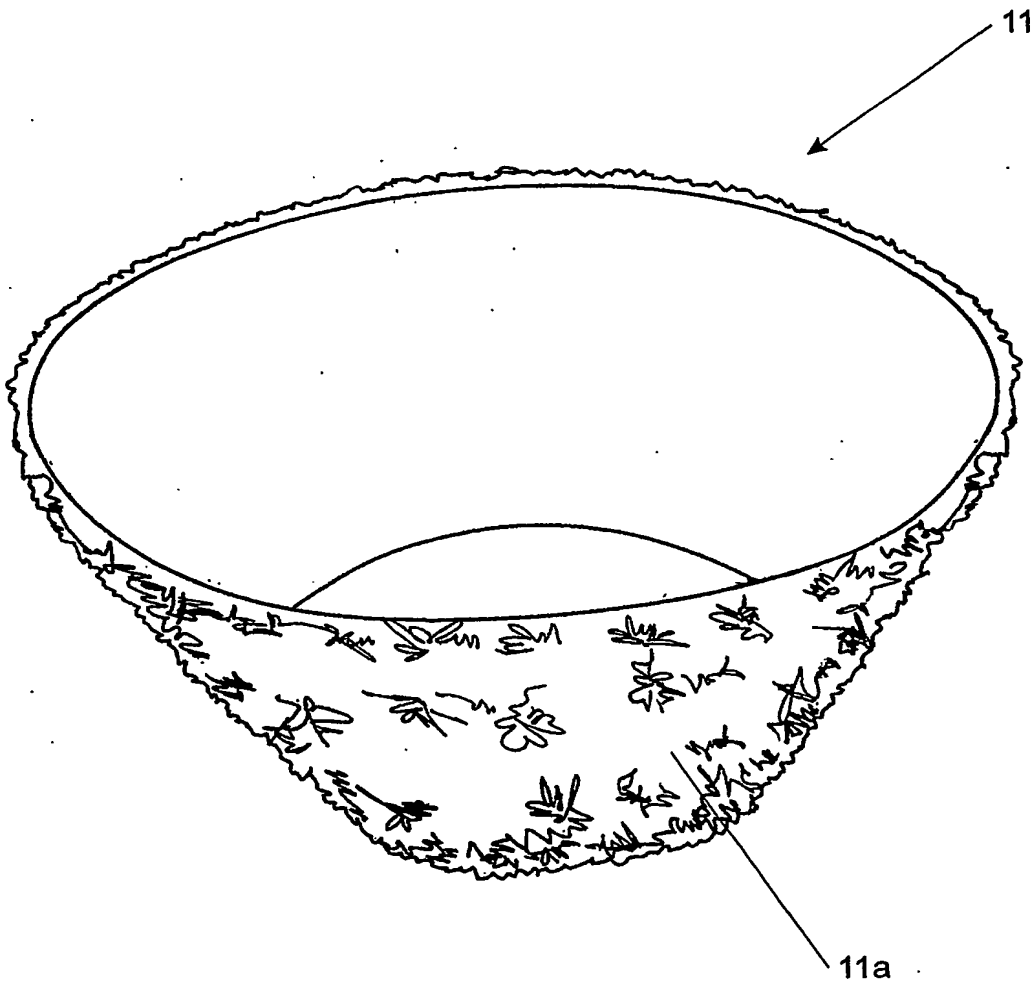

FIGURE 3

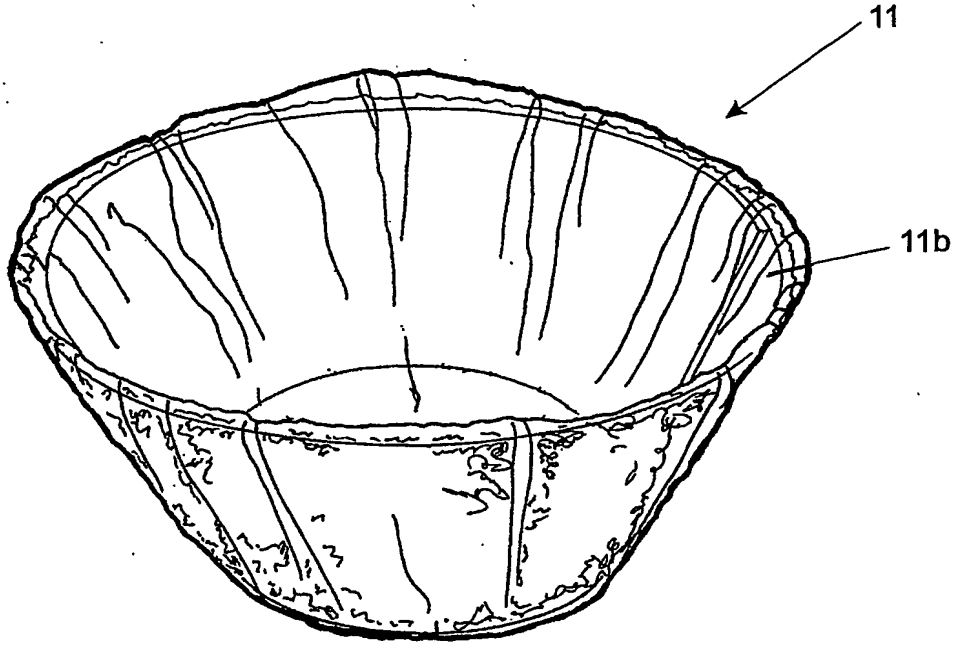

FIGURE 4

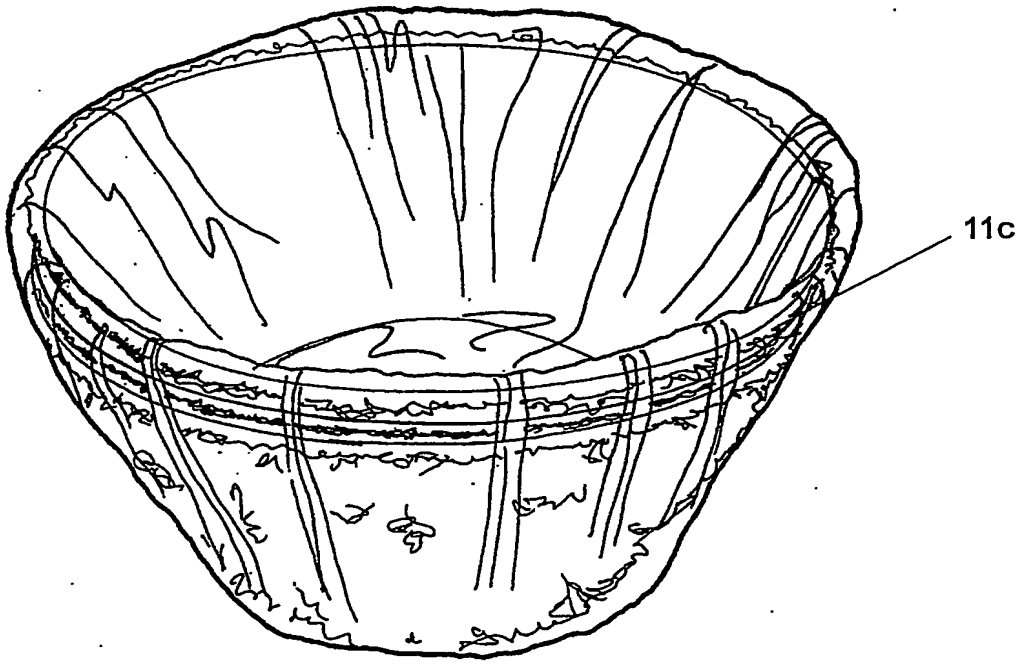

FIGURE 5

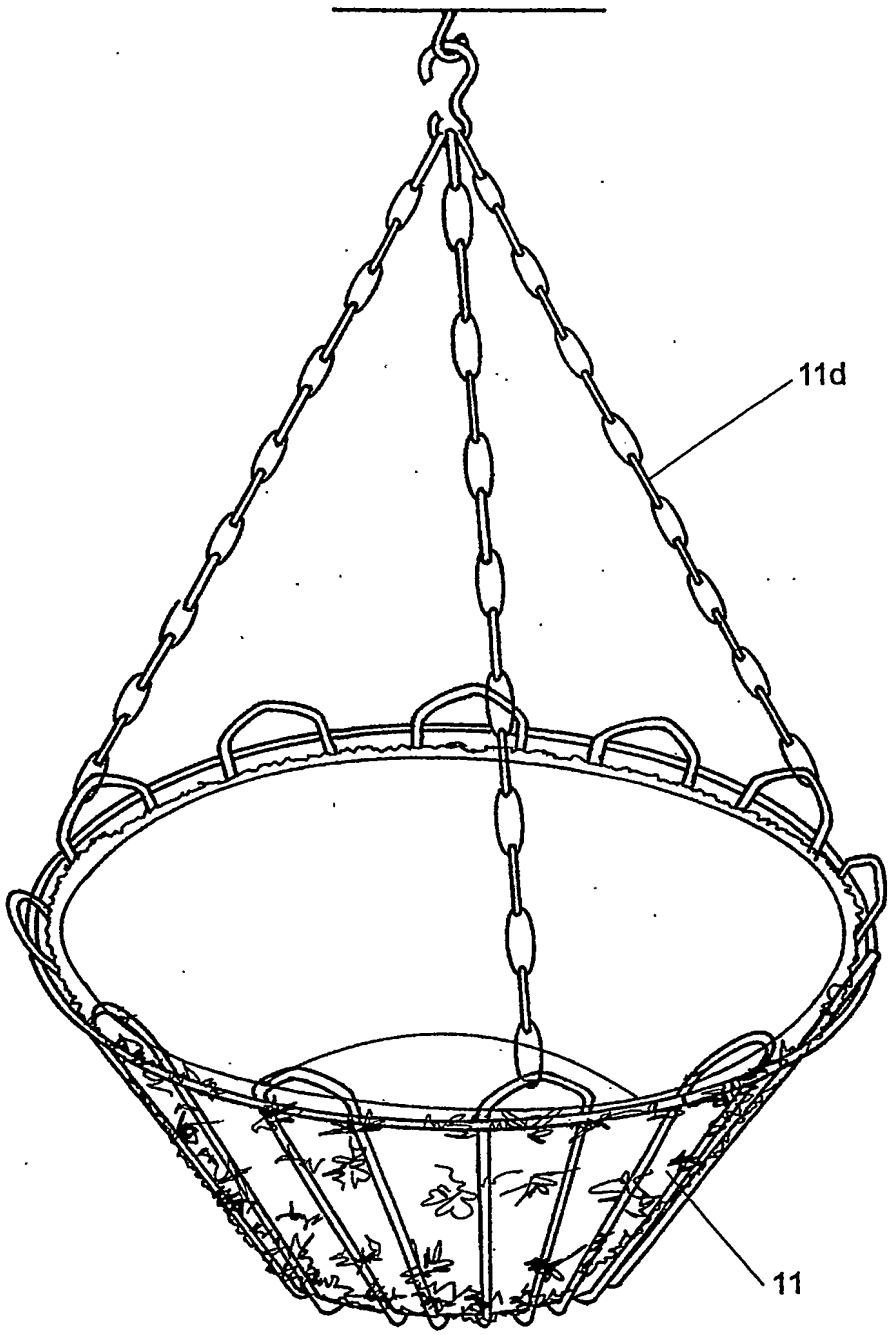

FIGURE 6

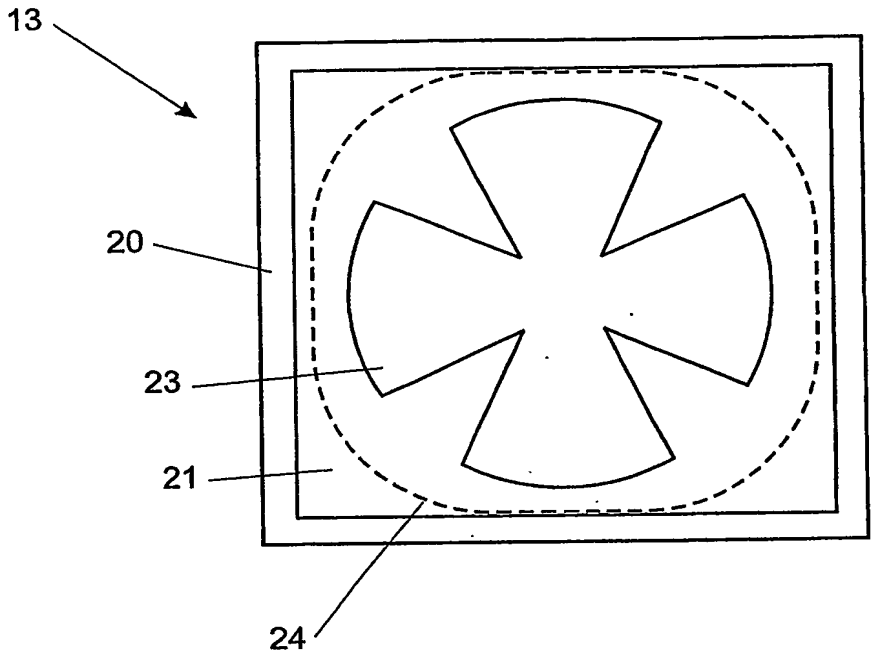

FIGURE 7

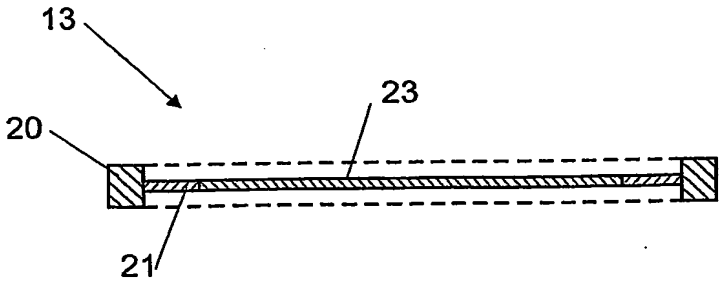

FIGURE 8

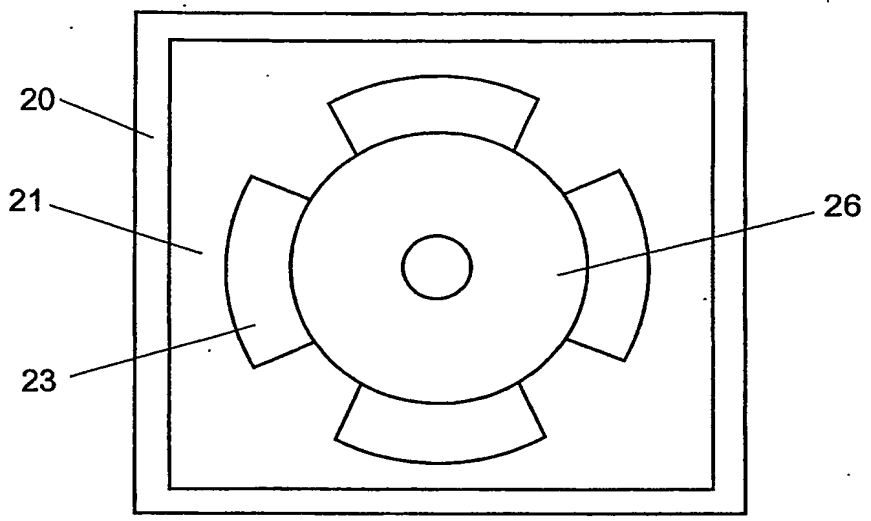

FIGURE 9

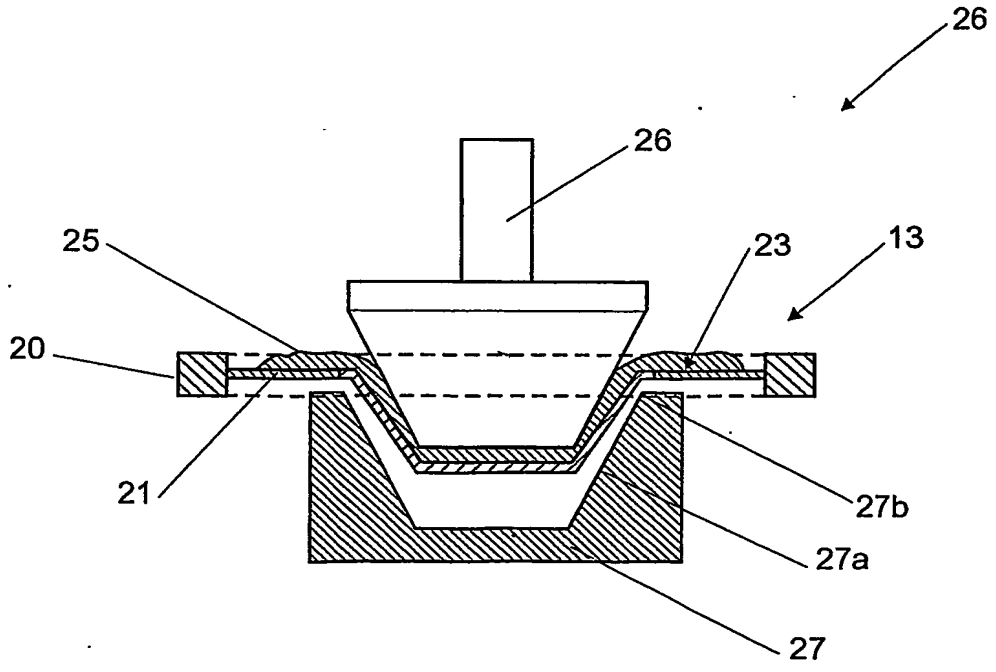

FIGURE 10